

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : TOSHIBA TEC CORP

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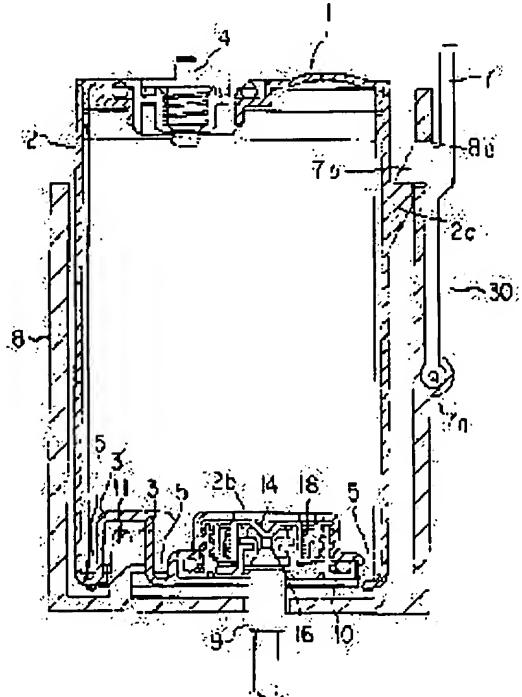
(72)Inventor : ITO TAKURO  
SUZUKI YASUHIRO  
NAKAMURA JUNICHI

## (54) INK BOTTLE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an ink bottle which can prevent an ink sediment from flowing out.

**SOLUTION:** An ink bottle 1 has a recess 2a for screwing a valve mechanism 10 to a bottom of a container body 2. A feed port 2b is formed to a position separated vertically upward from a bottom of the recess 2a, namely, bottom of the container body 2. Ink is sucked via the feed port 2b by an intake connector 9, and remains at a holding part 5 in the periphery of the recess 2a. A sediment because of a change with time of the ink is held in the holding part 5 and prevented from being supplied via the feed port 2b.



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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The ink bottle characterized by having the feed hopper arranged in the location estranged from the bottom of this body of a container to the vertical upper part within the body of a container which held ink, and this body of a container, and the passage into which the ink held in the above-mentioned body of a container is made to flow out of the bottom of the above-mentioned body of a container through the above-mentioned feed hopper.

[Claim 2] The above-mentioned ink is an ink bottle according to claim 1 characterized by being ink of the pigment system which distributed the coloring-material particle into the insulating liquid.

[Claim 3] The body of a container which held the ink which distributed the coloring-material particle into the insulating liquid, and the hollow which has a feed hopper in the location which it was dented and prepared in the bottom of this body of a container inside, and was estranged from the bottom of this body of a container to the vertical upper part, The valve mechanism which has the passage into which the ink which was attached in this hollow, without projecting from this hollow, and was supplied through the above-mentioned feed hopper is made to flow, and the bulb which open and close this passage, The ink bottle characterized by having a field within the above-mentioned body of a container from the bottom of the above-mentioned body of a container to the height of the above-mentioned feed hopper, and having an attaching part holding the ink which remained without being supplied through the above-mentioned feed hopper.

[Claim 4] The ink bottle according to claim 3 characterized by forming the field reduction means for making the field of this attaching part small and lessening residual ink in the above-mentioned attaching part.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Field of the Invention] This invention relates to the ink bottle for an ink jet printer etc. being equipped free [ desorption ] and supplying ink to the body of a printer.

**[0002]**

[Description of the Prior Art] In recent years, the ink jet printer which is made to breathe out ink through a nozzle with a long and slender recording head, and records information on a record medium has spread. Supply of the ink to an ink jet printer is made by generally equipping the body of a printer with the ink bottle filled up with ink free [ desorption ].

[0003] An ink bottle has a feed hopper for supplying ink to the bottom of the body of a container in which ink was held, and supplies ink to the body of a printer from the bottom of a container through the valve mechanism formed in this feed hopper.

[0004]

[Problem(s) to be Solved by the Invention] However, when the ink bottle mentioned above, for example is being kept in the warehouse for a long period of time, or when equipping the body of a printer with an ink bottle and having left it for a long period of time, it changes with time, and a coloring-material particle, a dispersant, etc. deposit, the physical properties of ink condense, and it is known for the ink of the pigment system containing especially a coloring-material particle and a dispersant that this aggregate will sediment at the bottom of an ink bottle.

[0005] Thus, when the body of a printer was equipped with the ink bottle which has sediment in the bottom of an ink bottle and ink was supplied, sediment flowed out through the feed hopper at the bottom of an ink bottle, and the nozzle of a recording head had produced the problems that the discharge direction of lifting ink did not become settled about blinding, such as a mistake direction. Furthermore, if the blinding of a nozzle becomes severe, it will become not only aggravation of recording characteristics, such as a mistake direction, but the cause of failure of the recording head itself.

[0006] This invention was made in view of the above point, and that purpose is in offering the ink bottle which can prevent making the sediment of ink flow out.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink bottle of this invention has the feed hopper arranged in the location estranged from the bottom of this body of a container to the vertical upper part within the body of a container which held ink, and this body of a container, and the passage into which the ink held in the above-mentioned body of a container is made to flow out of the bottom of the above-mentioned body of a container through the above-mentioned feed hopper.

[0008] Moreover, according to invention mentioned above, the above-mentioned ink is characterized by being ink of the pigment system which distributed the coloring-material particle into the insulating liquid.

[0009] Moreover, the body of a container which held the ink in which the ink bottle of this invention distributed the coloring-material particle into the insulating liquid, The hollow which has a feed hopper in the location which it was dented and prepared in the bottom of this body of a container inside, and was estranged from the bottom of this body of a container to the vertical upper part, The valve mechanism which has the passage into which the ink which was attached in this hollow, without projecting from this hollow, and was supplied through the above-mentioned feed hopper is made to flow, and the bulb which open and close this passage, It has a field within the above-mentioned body of a container from the bottom of the above-mentioned body of a container to the height of the above-mentioned feed hopper, and has an attaching part holding the ink which remained without being supplied through the above-mentioned feed hopper.

[0010] Furthermore, according to invention mentioned above, it is characterized by forming the field reduction means for making the field of this attaching part small and lessening residual ink in the above-mentioned attaching part.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained to a detail, referring to a drawing.

[0012] First, with reference to drawing 1 thru/or drawing 3, the ink bottle 1 concerning the gestalt of implementation of this invention is explained. The perspective view which looked at the cross section which cut the ink bottle 1 to the lengthwise direction in the center of abbreviation from the method of the diagonal right is shown in drawing 1, the condition of having removed the air plug device 4 and the valve mechanism 10 from the ink bottle 1 of drawing 1 is shown in drawing 2, and the perspective view which looked at the ink bottle of drawing 1 from the method of the diagonal below is shown in drawing 3.

[0013] The ink bottle 1 has the body 2 of a container of an abbreviation rectangular parallelepiped configuration, the air plug device 4 for introducing air in a bottle is attached in the top face of the body 2 of a container, and the valve mechanism 10 is attached in the bottom of the body 2 of a container free [ desorption ] through the filter 6. Moreover, claw part 2c for placing in a fixed position to the bottle hold circles which mention the body 2 of a container later is prepared in one side face of the body 2 of a container at one.

[0014] In order to equip with a valve mechanism 10, hollow 2a of an approximate circle form dented towards the inside from the outside of a container is formed in the bottom of the body 2 of a container. Circular feed hopper 2b for supplying the liquid held in the ink bottle 1 is formed in the pars basilaris ossis occipitalis of hollow 2a estranged from the bottom of the body 2 of a container to the vertical upper part, and the stop section for stopping the circular filter 6 is formed in it around feed hopper 2b. Moreover, the screw for screwing a valve mechanism 10 is turned off in the inner circle wall side of hollow 2a. The depth of hollow 2a is set as extent used as the location where the base of a valve mechanism 10 was dented more slightly than the base of the outside base of the body 2 of a container, flat-tapped, or the body 2 of a container, when a valve mechanism 10 is screwed through a filter 6.

[0015] When attaching a valve mechanism 10 in the body 2 of a container, it equips with the circular filter 6 in hollow 2a, and stops in the stop section, and a valve mechanism 10 is screwed in hollow 2a after that so that feed hopper 2b of hollow 2a may be closed.

[0016] A valve mechanism 10 has the spring 18 for pressing the passage 12 which makes the ink which flowed out through feed hopper 2b and the filter 6 of hollow 2a flow out out of the ink bottle 1, the bulb 14 which open and close this passage, the valve seal 16 which seals this bulb 14 to passage 12, and a bulb 14 to a valve seal 16. It is fixed to the upper limit of passage 12, and the valve seal 16 is pressed and stuck to the bulb 14 from the inside of this valve seal 16.

[0017] Moreover, when the bottle hold section which does not illustrate the ink bottle 1 and which printer equipment mentions later is equipped, the hollow 3 dented towards the inside from the outside of the body 2 of a container is formed in the location other than the location where it is the base of the body 2 of a container, and was equipped with the valve mechanism 10 so that the dowel which protruded from the bottom of the cavity which the bottle hold section mentions later may be accepted.

[0018] As a result of forming this hollow 3 in the bottom of the ink bottle 1, heights 3' corresponding to a hollow 3 is formed in the body 2 of a container. This heights 3' functions as a field reduction means which makes small the field from the bottom of the ink bottle 1 to the height of feed hopper 2b of hollow 2a, i.e., the field of the attaching part 5 holding the ink which remained at the bottom of the body 2 of a container, without being supplied through feed hopper 2b, around hollow 2a for screwing a valve mechanism 10, and lessens the amount of residual ink.

[0019] After filling up with the ink of a predetermined color, the bottle hold section in the printer equipment which is not illustrated is equipped with the ink bottle 1 constituted as mentioned above. The ink of the pigment system which made the insulating liquid distribute a coloring-

material particle and a dispersant is filled up with the gestalt of this operation into the ink bottle 1.

[0020] The bottle hold section 30 which equips drawing 4 with the ink bottle 1 mentioned above is shown. The cavity 8 of the abbreviation rectangle for holding the ink bottle 1 is formed in the bottle hold section 30. When a cavity 8 is equipped with the ink bottle 1, the dowel 11 accepted in the hollow 3 of the ink bottle 1 protrudes on the bottom of a cavity 8.

[0021] Moreover, when a cavity 8 is equipped with the ink bottle 1, the intake connector 9 which penetrated the bottom of a cavity 8 and was prolonged in the cavity 8 is fixed to the location where the passage 12 of a valve mechanism 10 counters. The pump which is not illustrated for attracting the ink held in the ink bottle 1 is connected to the end face section side which the intake connector 9 does not illustrate.

[0022] Furthermore, the holddown member 7 of the shape of a rod for fixing the ink bottle 1 to a predetermined location is attached in the lateral surface of a cavity 8. The end face section of a holddown member 7 is attached in the lateral surface of a cavity 8 free [ rotation ] through rotation shaft 7a, and fixed pawl 7b projected towards the cavity 8 near the tip of rotation of a holddown member 7 is prepared in one. Fixed pawl 7b engages with claw part 2c prepared in the side attachment wall of the ink bottle 1 held in the projection and the cavity 8 in the cavity 8 through side-face hole 8a to which a cavity 8 corresponds. Thereby, the ink bottle 1 is fixed in a cavity 8. The holddown member 7 is always energized by the location where the location of illustration, i.e., fixed pawl 7b, projects in a cavity 8 with the spring which is not illustrated.

[0023] If the cavity 8 of the bottle hold section 30 is equipped with the ink bottle 1, the dowel 11 of a cavity 8 will be accepted in the hollow 3 of the ink bottle 1, the tip of the intake connector 9 will be inserted in in the passage 12 of a valve mechanism 10, and a bulb 14 will be pushed up by the tip of the intake connector 9. Thereby, a bulb 14 is estranged from a valve seal 16, feed-holes 2b of hollow 2a is open for free passage, and suction of passage 12 is attained through the intake connector 9 in the ink in the ink bottle 1.

[0024] If ink is attracted and it is lost, the holddown member 7 of a cavity 8 will rotate, immobilization of the ink bottle 1 will be canceled, and the ink bottle 1 will be sampled from the cavity 8 of printer equipment. And a cavity 8 is equipped with the new ink bottle 1 filled up with ink.

[0025] As the ink bottle 1 of the gestalt of this operation was mentioned above, the attaching part 5 which accumulates ink in the surroundings of hollow 2a which screwed the valve mechanism 10 is formed in the location estranged from the bottom of the body 2 of a container to the vertical upper part for the structure of having feed hopper 2b. That is, since ink is supplied from the bottom of the body 2 of a container through feed hopper 2b, even if it attracts ink through feed hopper 2b by the intake connector 9, ink remains from feed hopper 2b slightly to the downward attaching part 5.

[0026] Thus, by having formed the attaching part 5 which accumulates ink in the bottom of the body 2 of a container For example, even if it is a case as it was left for a long period of time after equipping the bottle hold section 30 with the ink bottle 1 when the ink bottle 1 filled up with ink is being kept in the warehouse for a long period of time or Sediment which sedimented at the bottom of the ink bottle 1, such as a coloring-material particle and a dispersant, can be held in an attaching part 5, and it can prevent that sediment is supplied through feed hopper 2b.

[0027] As mentioned above, according to the gestalt of this operation, the sediment accompanying aging of ink is held in an attaching part 5, since it can prevent supplying through feed hopper 2b, it can prevent that the sediment of ink is supplied to un-wanting at the body of a

printer, and faults, such as blinding of the nozzle of a recording head and failure of the head itself, can be prevented. Moreover, by forming an attaching part 5 in the bottom of the ink bottle 1, the filter 6 attached in feed hopper 2b can also be excluded, and cost can be reduced.

[0028] Moreover, since heights 3' in the hollow 3 2 in which the dowel 11 of the bottle hold section 30 is accepted, i.e., the body of a container, functions as a field reduction means which makes the field of an attaching part 5 small, the amount of the residual ink which remains to an attaching part 5 can be lessened, and the amount of effective [ used ] of ink can be made [ many ].

[0029] In addition, this invention is not limited to the gestalt of operation mentioned above, and is variously deformable within the limits of this invention. For example, although the gestalt of operation mentioned above explained the case where the hollow 3 (heights 3') for accepting a dowel 11 was made into a field reduction means, as long as it is the structure which can lessen the field of the attaching part 5 formed in the bottom of not only this but the body 2 of a container, you may be what kind of thing.

[0030]

[Effect of the Invention] As explained above, since it has above configurations and operations, the ink bottle of this invention can prevent making the sediment of ink flow out of the body of a container, can hold sediment in an ink bottle and can prevent faults, such as blinding of the recording head by sediment.

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## TECHNICAL FIELD

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[Field of the Invention] This invention relates to the ink bottle for an ink jet printer etc. being equipped free [ desorption ] and supplying ink to the body of a printer.

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## PRIOR ART

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[Description of the Prior Art] In recent years, the ink jet printer which is made to breathe out ink through a nozzle with a long and slender recording head, and records information on a record medium has spread. Supply of the ink to an ink jet printer is made by generally equipping the body of a printer with the ink bottle filled up with ink free [ desorption ].

[0003] An ink bottle has a feed hopper for supplying ink to the bottom of the body of a container in which ink was held, and supplies ink to the body of a printer from the bottom of a container through the valve mechanism formed in this feed hopper.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] As explained above, since it has above configurations and operations, the ink bottle of this invention can prevent making the sediment of ink flow out of the body of a container, can hold sediment in an ink bottle and can prevent faults, such as blinding of the recording head by sediment.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, when the ink bottle mentioned above, for example is being kept in the warehouse for a long period of time, or when equipping the body of

a printer with an ink bottle and having left it for a long period of time, it changes with time, and a coloring-material particle, a dispersant, etc. deposit, the physical properties of ink condense, and it is known for the ink of the pigment system containing especially a coloring-material particle and a dispersant that this aggregate will sediment at the bottom of an ink bottle.

[0005] Thus, when the body of a printer was equipped with the ink bottle which has sediment in the bottom of an ink bottle and ink was supplied, sediment flowed out through the feed hopper at the bottom of an ink bottle, and the nozzle of a recording head had produced the problems that the discharge direction of lifting ink did not become settled about blinding, such as a mistake direction. Furthermore, if the blinding of a nozzle becomes severe, it will become not only aggravation of recording characteristics, such as a mistake direction, but the cause of failure of the recording head itself.

[0006] This invention was made in view of the above point, and that purpose is in offering the ink bottle which can prevent making the sediment of ink flow out.

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## MEANS

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[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink bottle of this invention has the feed hopper arranged in the location estranged from the bottom of this body of a container to the vertical upper part within the body of a container which held ink, and this body of a container, and the passage into which the ink held in the above-mentioned body of a container is made to flow out of the bottom of the above-mentioned body of a container through the above-mentioned feed hopper.

[0008] Moreover, according to invention mentioned above, the above-mentioned ink is characterized by being ink of the pigment system which distributed the coloring-material particle into the insulating liquid.

[0009] Moreover, the body of a container which held the ink in which the ink bottle of this invention distributed the coloring-material particle into the insulating liquid, The hollow which has a feed hopper in the location which it was dented and prepared in the bottom of this body of a container inside, and was estranged from the bottom of this body of a container to the vertical upper part, The valve mechanism which has the passage into which the ink which was attached in this hollow, without projecting from this hollow, and was supplied through the above-mentioned feed hopper is made to flow, and the bulb which open and close this passage, It has a field within the above-mentioned body of a container from the bottom of the above-mentioned body of a container to the height of the above-mentioned feed hopper, and has an attaching part holding the ink which remained without being supplied through the above-mentioned feed hopper.

[0010] Furthermore, according to invention mentioned above, it is characterized by forming the field reduction means for making the field of this attaching part small and lessening residual ink in the above-mentioned attaching part.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained to a detail, referring to a drawing.

[0012] First, with reference to drawing 1 thru/or drawing 3, the ink bottle 1 concerning the gestalt of implementation of this invention is explained. The perspective view which looked at the cross section which cut the ink bottle 1 to the lengthwise direction in the center of abbreviation from the method of the diagonal right is shown in drawing 1, the condition of

having removed the air plug device 4 and the valve mechanism 10 from the ink bottle 1 of drawing 1 is shown in drawing 2, and the perspective view which looked at the ink bottle of drawing 1 from the method of the diagonal below is shown in drawing 3.

[0013] The ink bottle 1 has the body 2 of a container of an abbreviation rectangular parallelepiped configuration, the air plug device 4 for introducing air in a bottle is attached in the top face of the body 2 of a container, and the valve mechanism 10 is attached in the bottom of the body 2 of a container free [ desorption ] through the filter 6. Moreover, claw part 2c for placing in a fixed position to the bottle hold circles which mention the body 2 of a container later is prepared in one side face of the body 2 of a container at one.

[0014] In order to equip with a valve mechanism 10, hollow 2a of an approximate circle form dented towards the inside from the outside of a container is formed in the bottom of the body 2 of a container. Circular feed hopper 2b for supplying the liquid held in the ink bottle 1 is formed in the pars basilaris ossis occipitalis of hollow 2a estranged from the bottom of the body 2 of a container to the vertical upper part, and the stop section for stopping the circular filter 6 is formed in it around feed hopper 2b. Moreover, the screw for screwing a valve mechanism 10 is turned off in the inner circle wall side of hollow 2a. The depth of hollow 2a is set as extent used as the location where the base of a valve mechanism 10 was dented more slightly than the base of the outside base of the body 2 of a container, flat-tapped, or the body 2 of a container, when a valve mechanism 10 is screwed through a filter 6.

[0015] When attaching a valve mechanism 10 in the body 2 of a container, it equips with the circular filter 6 in hollow 2a, and stops in the stop section, and a valve mechanism 10 is screwed in hollow 2a after that so that feed hopper 2b of hollow 2a may be closed.

[0016] A valve mechanism 10 has the spring 18 for pressing the passage 12 which makes the ink which flowed out through feed hopper 2b and the filter 6 of hollow 2a flow out out of the ink bottle 1, the bulb 14 which open and close this passage, the valve seal 16 which seals this bulb 14 to passage 12, and a bulb 14 to a valve seal 16. It is fixed to the upper limit of passage 12, and the valve seal 16 is pressed and stuck to the bulb 14 from the inside of this valve seal 16.

[0017] Moreover, when the bottle hold section which does not illustrate the ink bottle 1 and which printer equipment mentions later is equipped, the hollow 3 dented towards the inside from the outside of the body 2 of a container is formed in the location other than the location where it is the base of the body 2 of a container, and was equipped with the valve mechanism 10 so that the dowel which protruded from the bottom of the cavity which the bottle hold section mentions later may be accepted.

[0018] As a result of forming this hollow 3 in the bottom of the ink bottle 1, heights 3' corresponding to a hollow 3 is formed in the body 2 of a container. This heights 3' functions as a field reduction means which makes small the field from the bottom of the ink bottle 1 to the height of feed hopper 2b of hollow 2a, i.e., the field of the attaching part 5 holding the ink which remained at the bottom of the body 2 of a container, without being supplied through feed hopper 2b, around hollow 2a for screwing a valve mechanism 10, and lessens the amount of residual ink.

[0019] After filling up with the ink of a predetermined color, the bottle hold section in the printer equipment which is not illustrated is equipped with the ink bottle 1 constituted as mentioned above. The ink of the pigment system which made the insulating liquid distribute a coloring-material particle and a dispersant is filled up with the gestalt of this operation into the ink bottle 1.

[0020] The bottle hold section 30 which equips drawing 4 with the ink bottle 1 mentioned above is shown. The cavity 8 of the abbreviation rectangle for holding the ink bottle 1 is formed in the

bottle hold section 30. When a cavity 8 is equipped with the ink bottle 1, the dowel 11 accepted in the hollow 3 of the ink bottle 1 protrudes on the bottom of a cavity 8.

[0021] Moreover, when a cavity 8 is equipped with the ink bottle 1, the intake connector 9 which penetrated the bottom of a cavity 8 and was prolonged in the cavity 8 is fixed to the location where the passage 12 of a valve mechanism 10 counters. The pump which is not illustrated for attracting the ink held in the ink bottle 1 is connected to the end face section side which the intake connector 9 does not illustrate.

[0022] Furthermore, the holddown member 7 of the shape of a rod for fixing the ink bottle 1 to a predetermined location is attached in the lateral surface of a cavity 8. The end face section of a holddown member 7 is attached in the lateral surface of a cavity 8 free [ rotation ] through rotation shaft 7a, and fixed pawl 7b projected towards the cavity 8 near the tip of rotation of a holddown member 7 is prepared in one. Fixed pawl 7b engages with claw part 2c prepared in the side attachment wall of the ink bottle 1 held in the projection and the cavity 8 in the cavity 8 through side-face hole 8a to which a cavity 8 corresponds. Thereby, the ink bottle 1 is fixed in a cavity 8. The holddown member 7 is always energized by the location where the location of illustration, i.e., fixed pawl 7b, projects in a cavity 8 with the spring which is not illustrated.

[0023] If the cavity 8 of the bottle hold section 30 is equipped with the ink bottle 1, the dowel 11 of a cavity 8 will be accepted in the hollow 3 of the ink bottle 1, the tip of the intake connector 9 will be inserted in in the passage 12 of a valve mechanism 10, and a bulb 14 will be pushed up by the tip of the intake connector 9. Thereby, a bulb 14 is estranged from a valve seal 16, feed-holes 2b of hollow 2a is open for free passage, and suction of passage 12 is attained through the intake connector 9 in the ink in the ink bottle 1.

[0024] If ink is attracted and it is lost, the holddown member 7 of a cavity 8 will rotate, immobilization of the ink bottle 1 will be canceled, and the ink bottle 1 will be sampled from the cavity 8 of printer equipment. And a cavity 8 is equipped with the new ink bottle 1 filled up with ink.

[0025] As the ink bottle 1 of the gestalt of this operation was mentioned above, the attaching part 5 which accumulates ink in the surroundings of hollow 2a which screwed the valve mechanism 10 is formed in the location estranged from the bottom of the body 2 of a container to the vertical upper part for the structure of having feed hopper 2b. That is, since ink is supplied from the bottom of the body 2 of a container through feed hopper 2b, even if it attracts ink through feed hopper 2b by the intake connector 9, ink remains from feed hopper 2b slightly to the downward attaching part 5.

[0026] Thus, by having formed the attaching part 5 which accumulates ink in the bottom of the body 2 of a container For example, even if it is a case as it was left for a long period of time after equipping the bottle hold section 30 with the ink bottle 1 when the ink bottle 1 filled up with ink is being kept in the warehouse for a long period of time or Sediment which sedimented at the bottom of the ink bottle 1, such as a coloring-material particle and a dispersant, can be held in an attaching part 5, and it can prevent that sediment is supplied through feed hopper 2b.

[0027] As mentioned above, according to the gestalt of this operation, the sediment accompanying aging of ink is held in an attaching part 5, since it can prevent supplying through feed hopper 2b, it can prevent that the sediment of ink is supplied to un-wanting at the body of a printer, and faults, such as blinding of the nozzle of a recording head and failure of the head itself, can be prevented. Moreover, by forming an attaching part 5 in the bottom of the ink bottle 1, the filter 6 attached in feed hopper 2b can also be excluded, and cost can be reduced.

[0028] Moreover, since heights 3' in the hollow 3 2 in which the dowel 11 of the bottle hold

section 30 is accepted, i.e., the body of a container, functions as a field reduction means which makes the field of an attaching part 5 small, the amount of the residual ink which remains to an attaching part 5 can be lessened, and the amount of effective [ used ] of ink can be made [ many ].

[0029] In addition, this invention is not limited to the gestalt of operation mentioned above, and is variously deformable within the limits of this invention. For example, although the gestalt of operation mentioned above explained the case where the hollow 3 (heights 3') for accepting a dowel 11 was made into a field reduction means, as long as it is the structure which can lessen the field of the attaching part 5 formed in the bottom of not only this but the body 2 of a container, you may be what kind of thing.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] The cross-section perspective view which cut the ink bottle concerning the gestalt of implementation of this invention to the lengthwise direction in that center of abbreviation.

[Drawing 2] The cross-section perspective view showing the condition of having removed the air plug device and the valve mechanism from the ink bottle of drawing 1 .

[Drawing 3] The cross-section perspective view which looked at the ink bottle of drawing 1 from the method of the diagonal below.

[Drawing 4] The sectional view showing the condition of having equipped the bottle hold section of an ink jet printer with the ink bottle of drawing 1 .

### [Description of Notations]

- 1 -- Ink bottle,
  - 2 -- Body of a container,
  - 2a -- Hollow,
  - 2b -- Feed hopper,
  - 3 -- Hollow,
  - 3' -- Heights,
  - 5 -- Attaching part,
  - 6 -- Filter,
  - 8 -- Cavity,
  - 9 -- Intake connector,
  - 10 -- Valve mechanism
  - 11 -- Dowel,
  - 12 -- Passage.
- 

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(71) 出願人

000003562  
東芝テック株式会社

東京都千代田区神田錦町1丁目1番地

(72) 発明者

伊藤 順郎

静岡県三島市南町6番78号 東芝テック株式会社三島事業所内

(72) 発明者

鈴木 康裕

静岡県三島市南町6番78号 東芝テック株式会社三島事業所内

(74) 代理人

100058479

弁理士 鈴江 武彦 (外6名)

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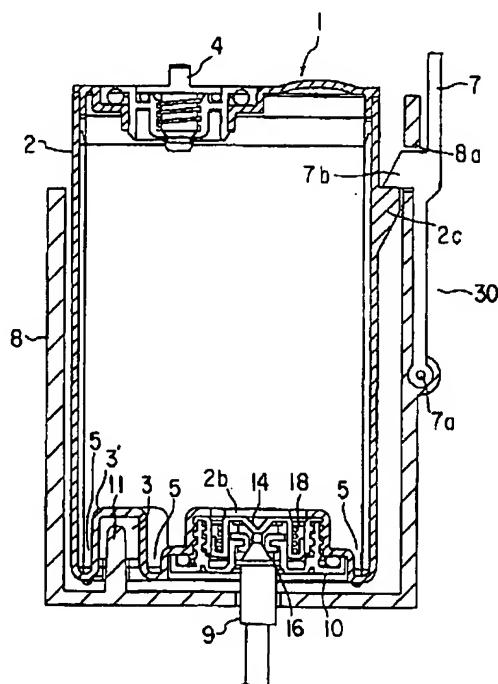
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(54) 【発明の名称】 インクボトル

(57) 【要約】

【課題】 この発明は、インクの沈降物を流出させることを防止できるインクボトルを提供することを課題とする。

【解決手段】 インクボトル1は、容器本体2の底にバルブ機構10を螺合するための凹所2aを有する。凹所2aの底、すなわち容器本体2の底より鉛直上方に離間した位置には、容器本体2内のインクを供給するための供給口2bが形成されている。インテークコネクタ9によって供給口2bを介してインクが吸引され、凹所2aの周りの保持部5にインクが残留する。インクの経時変化に伴う沈降物は、保持部5内に保持され、供給口2bを介して供給されることが防止される。



**【特許請求の範囲】**

**【請求項 1】** インクを収容した容器本体と、この容器本体内で該容器本体の底より鉛直上方に離間した位置に配設された供給口と、上記容器本体内に収容したインクを上記供給口を介して上記容器本体の底から流出させる流路と、を有することを特徴とするインクボトル。

**【請求項 2】** 上記インクは、絶縁性液体に色剤粒子を分散した顔料系のインクであることを特徴とする請求項 1 に記載のインクボトル。

**【請求項 3】** 絶縁性液体に色剤粒子を分散したインクを収容した容器本体と、この容器本体の底に内側に凹んで設けられ、該容器本体の底より鉛直上方に離間した位置に供給口を有する凹所と、この凹所から突出すことなく該凹所内に取付けられ、上記供給口を介して供給されたインクを流出させる流路、およびこの流路を開閉するバルブを有するバルブ機構と、

上記容器本体の底から上記供給口の高さまでの上記容器本体内の領域を有し、上記供給口を介して供給されずに残留したインクを保持する保持部と、

を有することを特徴とするインクボトル。

**【請求項 4】** 上記保持部には、該保持部の領域を小さくして残留インクを少なくするための領域減少手段が設けられていることを特徴とする請求項 3 に記載のインクボトル。

**【発明の詳細な説明】**

**【0001】**

**【発明の属する技術分野】** この発明は、インクジェットプリンタなどに脱着自在に装着されプリンタ本体にインクを補給するためのインクボトルに関する。

**【0002】**

**【従来の技術】** 近年、記録ヘッドの細長いノズルを介してインクを吐出させて記録媒体に情報を記録するインクジェットプリンタが普及されている。インクジェットプリンタへのインクの補給は、一般に、インクを充填したインクボトルをプリンタ本体に脱着自在に装着することによりなされる。

**【0003】** インクボトルは、インクを収容した容器本体の底にインクを供給するための供給口を有し、この供給口に設けられたバルブ機構などを介して容器の底からプリンタ本体にインクを補給する。

**【0004】**

**【発明が解決しようとする課題】** しかし、例えば上述したインクボトルを倉庫で長期間保管していたような場合、あるいはインクボトルをプリンタ本体に装着して長期間放置していたような場合、特に色剤粒子や分散剤を含む顔料系のインクでは、インクの物性が経時に変化して色剤粒子や分散剤などが析出、凝集し、この凝集物

がインクボトルの底に沈降することが知られている。

**【0005】** このようにインクボトルの底に沈降物があるインクボトルをプリンタ本体に装着してインクを補給すると、インクボトルの底にある供給口を介して沈降物が流出され、記録ヘッドのノズルが目詰まりを起こしインクの吐出方向が定まらないミスディレクションなどの問題を生じていた。さらに、ノズルの目詰まりがひどくなると、ミスディレクションなどの記録特性の悪化のみならず、記録ヘッド自体の故障の原因にもなる。

**【0006】** この発明は、以上の点に鑑みなされたもので、その目的は、インクの沈降物を流出させることを防止できるインクボトルを提供することにある。

**【0007】**

**【課題を解決するための手段】** 上記目的を達成するため、本発明のインクボトルは、インクを収容した容器本体と、この容器本体内で該容器本体の底より鉛直上方に離間した位置に配設された供給口と、上記容器本体内に収容したインクを上記供給口を介して上記容器本体の底から流出させる流路と、を有する。

**【0008】** また、上述した発明によると、上記インクは、絶縁性液体に色剤粒子を分散した顔料系のインクであることを特徴とする。

**【0009】** また、本発明のインクボトルは、絶縁性液体に色剤粒子を分散したインクを収容した容器本体と、この容器本体の底に内側に凹んで設けられ、該容器本体の底より鉛直上方に離間した位置に供給口を有する凹所と、この凹所から突出すことなく該凹所内に取付けられ、上記供給口を介して供給されたインクを流出させる流路、およびこの流路を開閉するバルブを有するバルブ機構と、上記容器本体の底から上記供給口の高さまでの上記容器本体内の領域を有し、上記供給口を介して供給されずに残留したインクを保持する保持部と、を有する。

**【0010】** 更に、上述した発明によると、上記保持部には、該保持部の領域を小さくして残留インクを少なくするための領域減少手段が設けられていることを特徴とする。

**【0011】**

**【発明の実施の形態】** 以下、図面を参照しながらこの発明の実施の形態について詳細に説明する。

**【0012】** まず、図 1 乃至図 3 を参照して、この発明の実施の形態に係るインクボトル 1 について説明する。図 1 にはインクボトル 1 をその略中央で縦方向に切断した断面を右斜め上方から見た斜視図を示してあり、図 2 には図 1 のインクボトル 1 からエアプラグ機構 4 とバルブ機構 10 を取り外した状態を示してあり、図 3 には図 1 のインクボトルを右斜め下方から見た斜視図を示している。

**【0013】** インクボトル 1 は、略直方体形状の容器本体 2 を有し、容器本体 2 の上面にはボトル内に空気を導

入するためのエアプラグ機構4が取付けられ、容器本体2の底にはフィルタ6を介してバルブ機構10が脱着自在に取付けられている。また、容器本体2の一側面には、容器本体2を後述するボトル収容部内に固定配置するための爪部2cが一体に設けられている。

【0014】容器本体2の底には、バルブ機構10を装着するため容器の外側から内側に向けて凹んだ略円形の凹所2aが形成されている。容器本体2の底から鉛直上方に離間した凹所2aの底部には、インクボトル1に収容した液体を供給するための円形の供給口2bが形成され、供給口2bの周りには円形のフィルタ6を係止するための係止部が形成されている。また、凹所2aの内周壁面には、バルブ機構10を螺合するためのネジが切られている。凹所2aの深さは、フィルタ6を介してバルブ機構10を螺合したとき、バルブ機構10の底面が容器本体2の外側底面と面一、もしくは容器本体2の底面より僅かに凹んだ位置となる程度に設定されている。

【0015】バルブ機構10を容器本体2に取付ける場合、凹所2aの供給口2bを塞ぐように、凹所2a内に円形のフィルタ6を装着して係止部に係止し、その後、凹所2aにバルブ機構10を螺合する。

【0016】バルブ機構10は、凹所2aの供給口2bおよびフィルタ6を介して流出されたインクをインクボトル1の外へ流出させる流路12、この流路を開閉するバルブ14、このバルブ14を流路12に密閉するバルブシール16、およびバルブ14をバルブシール16に押圧するためのバネ18を有する。バルブシール16は流路12の上端に固設され、このバルブシール16の内側からバルブ14が押圧されて密着されている。

【0017】また、容器本体2の底面であってバルブ機構10が装着された位置とは別の位置には、インクボトル1を図示しないプリンタ装置の後述するボトル収容部に装着したとき、ボトル収容部の後述する凹陷部の底から突設されたダボを受入れるように、容器本体2の外側から内側に向けて凹んだ凹所3が形成されている。

【0018】この凹所3をインクボトル1の底に形成した結果、容器本体2内に凹所3に対応した凸部3'が形成される。この凸部3'は、バルブ機構10を螺合するための凹所2aの周りでインクボトル1の底から凹所2aの供給口2bの高さまでの領域、すなわち供給口2bを介して供給されずに容器本体2の底に残留したインクを保持する保持部5の領域を小さくして残留インクの量を少なくする領域減少手段として機能する。

【0019】上記のように構成されたインクボトル1は、所定の色のインクが充填された後、図示しないプリンタ装置内のボトル収容部へ装着される。本実施の形態では、絶縁性の液体に色剤粒子や分散剤を分散させた顔料系のインクがインクボトル1に充填される。

【0020】図4には、上述したインクボトル1を装着するボトル収容部30を示してある。ボトル収容部30

には、インクボトル1を収容するための略矩形の凹陷部8が設けられている。凹陷部8の底には、凹陷部8にインクボトル1を装着したときインクボトル1の凹所3に受入れられるダボ11が突設されている。

【0021】また、凹陷部8にインクボトル1を装着したとき、バルブ機構10の流路12が対向する位置には、凹陷部8の底を貫通して凹陷部8内に延びたインテークコネクタ9が固設されている。インテークコネクタ9の図示しない基端部側には、インクボトル1内に収容されているインクを吸引するための図示しないポンプが接続されている。

【0022】さらに、凹陷部8の外側面には、インクボトル1を所定位置に固定するための棒状の固定部材7が取付けられている。固定部材7の基端部は回動軸7aを介して凹陷部8の外側面に回動自在に取付けられ、固定部材7の回動の先端近くには凹陷部8に向けて突出した固定爪7bが一体に設けられている。固定爪7bは、凹陷部8の対応する側面孔8aを介して凹陷部8内に突出し、凹陷部8内に収容されたインクボトル1の側壁に設けられた爪部2cに係合する。これにより、インクボトル1が凹陷部8内に固定される。固定部材7は、図示しないバネ等により図示の位置、すなわち固定爪7bが凹陷部8内に突出する位置に常時付勢されている。

【0023】ボトル収容部30の凹陷部8にインクボトル1が装着されると、凹陷部8のダボ11がインクボトル1の凹所3に受入れられ、インテークコネクタ9の先端がバルブ機構10の流路12内に挿通され、インテークコネクタ9の先端によってバルブ14が押し上げられる。これにより、バルブ14がバルブシール16から離間され、流路12が凹所2aの供給孔2bに連通され、インクボトル1内のインクをインテークコネクタ9を介して吸引可能となる。

【0024】インクが吸引されて無くなると、凹陷部8の固定部材7が回動されてインクボトル1の固定が解除され、インクボトル1がプリンタ装置の凹陷部8から抜き取られる。そして、インクを充填した新たなインクボトル1が凹陷部8に装着される。

【0025】本実施の形態のインクボトル1は、上述したように、容器本体2の底より鉛直上方に離間した位置に供給口2bを有する構造のため、バルブ機構10を螺合した凹所2aの周りにインクを溜める保持部5が形成される。つまり、供給口2bを介して容器本体2の底からインクを供給するので、インテークコネクタ9によって供給口2bを介してインクを吸引しても、供給口2bより下方の保持部5にインクが僅かに残留する。

【0026】このように、容器本体2の底にインクを溜める保持部5を設けたことにより、例えば、インクを充填したインクボトル1を倉庫で長期間保管していたような場合、あるいはインクボトル1をボトル収容部30に装着してから長期間放置していたような場合であって

も、インクボトル1の底に沈降した色剤粒子や分散剤などの沈降物を保持部5内に保持でき、沈降物が供給口2bを介して供給されることを防止できる。

【0027】以上のように、本実施の形態によると、インクの経時変化に伴う沈降物を保持部5内に保持し、供給口2bを介して供給することを防止できるため、プリンタ本体にインクの沈降物が不所望に供給されることを防止でき、記録ヘッドのノズルの目詰まりやヘッド自体の故障などの不具合を防止できる。また、インクボトル1の底に保持部5を設けることにより、供給口2bに取付けたフィルタ6を省くこともでき、コストを低減できる。

【0028】また、ボトル収容部30のダボ11を受入れる凹所3、即ち容器本体2内の凸部3'が保持部5の領域を小さくする領域減少手段として機能するため、保持部5に残留する残留インクの量を少なくでき、インクの有効使用量を多くできる。

【0029】尚、この発明は、上述した実施の形態に限定されるものではなく、この発明の範囲内で種々変形可能である。例えば、上述した実施の形態では、ダボ11を受入れるための凹所3（凸部3'）を領域減少手段とした場合について説明したが、これに限らず、容器本体2の底に形成された保持部5の領域を少なくできる構造であればいかなるものであっても良い。

#### 【0030】

【発明の効果】以上説明したように、この発明のインクボトルは、上記のような構成および作用を有しているの

で、インクの沈降物を容器本体から流出させることを防止でき、沈降物をインクボトル内に保持でき、沈降物による記録ヘッドの目詰まりなどの不具合を防止できる。

#### 【図面の簡単な説明】

【図1】この発明の実施の形態に係るインクボトルをその略中央で縦方向に切断した断面斜視図。

【図2】図1のインクボトルからエアプラグ機構とバルブ機構を取り外した状態を示す断面斜視図。

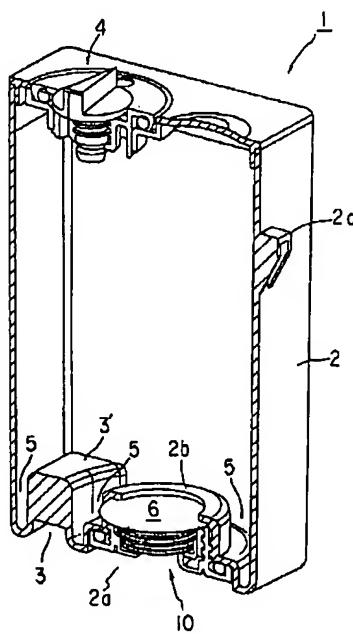
【図3】図1のインクボトルを右斜め下方から見た断面斜視図。

【図4】図1のインクボトルをインクジェットプリンタのボトル収容部に装着した状態を示す断面図。

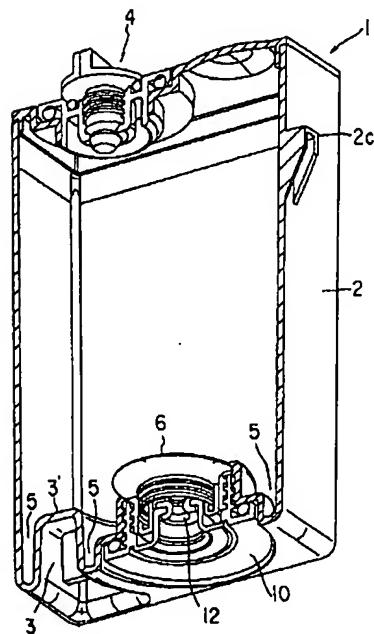
#### 【符号の説明】

- 1…インクボトル、
- 2…容器本体、
- 2a…凹所、
- 2b…供給口、
- 3…凹所、
- 3'…凸部、
- 5…保持部、
- 6…フィルタ、
- 8…凹陥部、
- 9…インテーカコネクタ、
- 10…バルブ機構、
- 11…ダボ、
- 12…流路。

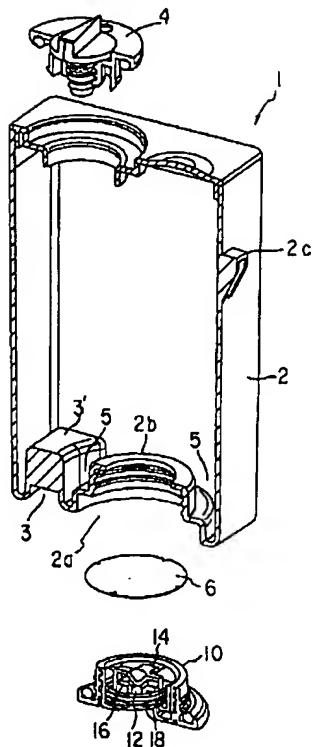
【図1】



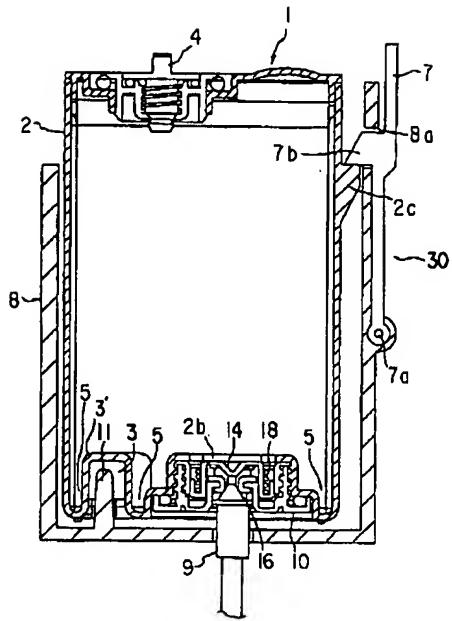
【図3】



【図2】



【図4】



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(72)発明者 中村 純一

静岡県三島市南町6番78号 東芝テック株  
式会社三島事業所内

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